CLAIMS

[Claim(s)]

[Claim 1] The hinge axis fixed to one member, and the base portion material which is inserted in this hinge axis free [rotation], and is fixed to the member of another side, Closing mechanism characterized by being inserted in the **** direction in which rotation is restrained by said hinge axis free [movement], consisting of a spring member pressed by base portion material in the regulation member, and forming the contact surface of said base portion material and a spring member in a cam.

[Claim 2] The cam of the contact surface of said base portion material and a spring member is closing mechanism according to claim 1 characterized by for one side being a crevice and another side being a convex part.

[Claim 3] Said spring member is closing mechanism according to claim 1 or 2 characterized by being a spring washer.

[Claim 4] Said spring washer is closing mechanism according to claim 3 characterized by being formed in the shape of V type, and the contact surface with the spring washer of base portion material serving as the shape of V type corresponding to the shape of said V type.

[Claim 5] Closing mechanism according to claim 3 characterized by fixing the ball to both sides of said spring washer, and forming the hemispherical crevice corresponding to said ball also in a contact surface with the spring washer of base portion material.

[Claim 6] Said spring washer is closing mechanism according to claim 3 characterized by forming a cam in the contact surface side with base portion material, and forming the convex part in an opposite side.

[Claim 7] As for said regulation member, the Claims 1-6 characterized by being a control washer are the closing mechanism of a description either.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the closing mechanism connected possible [opening and closing of two members like main parts, such as small OA equipment, such as a notebook computer and a cellular-phone machine, and a handheld device machine, and a lid].

[0002]

[Description of the Prior Art] The lid with which as for information machines and equipment like a notebook computer and a cellular-phone machine a keyboard is formed in a main part, a display device is formed in a lid, and the display device is formed is connected with closing mechanism so that opening and closing, stop, and maintenance may be made to a legible angle. Such conventional closing mechanism coincides an axis line with a pair of mutual cams. When it is prepared possible [approach and estrangement] that relative rotation is possible and mutually, it is energized and it becomes so that the cam side of these cams may be mutually close with a spring, and both cams rotate relatively What both cams move relatively along with those axis lines, and changes the angle relation between both cams is common.

[0003]

[Problem to be solved by the invention] Although it fully has functions, such as opening and closing of a display device (lid), a stop, and maintenance, also with said conventional closing mechanism, the conventional closing mechanism has the technical problem which has many part mark that structure is also complicated. Therefore, since the cam part which fits in mutually is prepared in that trouble starts manufacture and manufacture expense also serves as a **** cost overrun, the cam member, and the sliding cam member (said both cams), there is a limit in making the size (length) of the direction of an axis small (miniaturization). Furthermore, part mark require [as and structure is also complicated / attachment of parts] trouble and are serious.

[0004] This invention is made in view of such a point, the purpose is easy structure, there are also few part mark, and attachment is also easy the purpose, and a light weight and a miniaturization are possible for it, and, moreover, it is in offer o

[0005]

[Means for solving problem] The hinge axis fixed to the closing mechanism of Claim 1 of this invention, and one member in order to solve said technical problem, The base portion material which is inserted in this hinge axis free [rotation], and is fixed to the member of another side, It is inserted in the **** direction in which rotation is restrained by said hinge axis free [movement], consists of a spring member pressed by base portion material in the regulation member, and is characterized by forming the contact surface of said base portion material and

a spring member in a cam.
[0006] Moreover, as for the closing mechanism of Claim 2 of this invention, the cam of the contact surface of said base portion material and a

[0007] Moreover, closing mechanism of Claim 3 of this invention is characterized by said spring member being a
[0008] Moreover, said spring washer is formed in the shape of V type, and, as for the closing mechanism of Claim 4 of this invention, is characterized by the contact surface with the spring washer of base portion material serving as the shape of V type corresponding to the shape of said V type.
[0009] Moreover, the is fixed to both sides of said spring washer, and closing mechanism of Claim 5 of this invention is characterized by forming the hemispherical crevice corresponding to said ball also in a contact surface with the spring washer of base portion material.
[0010] Moreover, closing mechanism of Claim 6 of this invention is characterized by for said spring washer forming a cam in the contact surface side with base portion material, and forming the convex part in an opposite side.
[0011] Furthermore, closing mechanism of Claim 7 of this invention is characterized by said regulation member being a
[0012]
[Mode for carrying out the invention] The form of operation of this invention is hereafter explained in detail with Drawings. Drawing 1 is a hinge axis concerning the form of operation of this invention, and, in (a), a top view and (b) are [a front view and (c)] side views. The hinge axis 1 consists of a flange 1a and and the (a figure WD cut form) is formed, and it is un-circular. [of the flange 1a] One member, for example, a lid, is fixed to the flange 1a of this hinge axis 1. One member contributes the un-circular form part 1b of the flange 1a to being fixed improper [rotation]. Moreover, the tip of un-circular **** 1c serves as 1d of narrow diameter portions.
[0013] Drawing 2 is the base portion material concerning the form of operation of this invention, and, in (a), a top view and (b) are [a front view and (c)] side views. the base portion material 2 -- short -- it is cylindrical, Boss the un-circular form part 2c is formed in a lateral surface, and the V character-like slot 2b is further formed in the end side as a cam part. This base portion material 2 is fixed to the member of another side, for example, a main part. The is useful to attach to the member of another side improper [rotation].
[0014] Drawing 3 shows the concerning the form of operation of this invention, (a) is a front view and (b) is a side view. The spring washer 3 is ****(ed) in the shape of **** in

the center, the top part is made into the convex part 3b, and the is drilled in the center. It is useful for this un-circular hole in un-circular **** 1c of the hinge axis 1.

[0015] Drawing 4 is the exploded perspective view showing the form of operation of this invention. The above mentioned base portion material 2 and the above mentioned spring washer 3 are inserted and attached to un-circular **** 1c of the hinge axis 1 in the order shown in drawing 4 . Drawing 5 shows the perspective view (a), top view (b), and front view (c) in the state where said each part article was attached and was completed.

the end side of the base portion material 2, and is fixed to un-circular **** 1c of the hinge axis 1 Other means, such as not only caulking but a push nut, C ring, screw bonding link material, etc., are sufficient as this fastener means. At this time, since it is circular Boss 2a, even if it is inserted in un-circular **** 1c of the hinge axis 1, can be freely rotated by the base portion material 2, and it serves as move freedom in the direction of an axis, and [the spring washer 3] Since it is the un-circular hole 3a, if it inserts in un-circular **** 1c of the hinge axis 1, rotation will be restrained for the un-circular portions of un-circular **** 1c and the un-circular hole 3a, rotating will become impossible,

[0016] Therefore, if the flange 1a of the hinge axis 1 is fixed to one member, the base portion material 2 is fixed to the member of another side and one side or another side is opened and closed, while the hinge axis 1 rotates, the spring washer 3 will also synchronize and will rotate. [then, the convex part 3b of the spring washer 3] Since a position shifts and is compressed from the cam part (V character-like slot) 2b of the base portion material 2, moreover -- if the convex part 3b and the cam part (V character-like slot) 2b of the spring washer 3 agree -- an instant -- the energization power of a spring washer -- release -- or it becomes weak and a feeling That is, a rotational torque occurs by relative rotation of the spring washer 3 and the base portion material 2 influenced by the relative angle of the convex part 3b of the spring washer 3, and the cam part 2b of the base portion material 2, and this rotational torque performs opening and closing of two members, for example, opening and closing of a lid. In the form of this operation, since it is arranged at 180-degree symmetry, when the cam part 2b of the base portion material 2 will generate a feeling of a click every 180 degrees, it applies torque in the stoppage direction when shutting a lid, for example, and it opens a lid, the maintenance of it at the angle opened a little less than 180 degrees is attained. In this example, the maintenance angle of a lid, a feeling, etc. are freely changeable, for example by changing the arrangement angle of the cam part 2b of the base portion material 2, form, a

number, etc. In addition, although the cam part 2b of the base portion material 2 is a crevice of a V character-like slot and the spring washer 3 serves as a convex part of the shape of **** corresponding to this in Drawings, even if this is reverse, it carries out the same operation. That is, the cam part 2b of the base portion material 2 may be a Yamagata-like convex part, and the spring washer 3 may be the crevice of the shape of a V character corresponding to this.

[0017] Moreover, drawing 6 is the top view (a) and front view showing the form of other operations of this invention. The form material 2, and has material 2, since others are the same as that of the form of said operation, the same mark is attached and detailed explanation is omitted. According to the form of this operation, a bigger rotational torque can be obtained material 2. Moreover, a still bigger rotational torque can be obtained by

[0018] Drawing 7 is the top view (a), front view (b), and side view (c) of the base portion material concerning the form of other operations of this invention. The cam part 2b by which the form of this operation is formed in the end side of the base portion material 2 is a U character slot, and that of others is the same as that of the form of said operation. Naturally the convex part corresponding to is prepared also in the spring washer 3.

[0019] Drawing 8 is the front view (a), side view (b), and central longitudinal section showing the spring washer concerning the form of other operations of this invention. the form of this operation is an example of the corresponding to the base portion material 2 shown in said drawing 7 , and the corresponding to the U character slot as a cam part 2b of said base portion material 2 is formed in the spring washer 3 -- on the other hand -- being also alike -- the convex part 3c is formed.

[0020] Therefore, the same operation as the form of said operation is carried out in the U character slot 3b and the convex part 3c also with the spring washer 3 shown in the base portion material 2 shown in drawing 7 , and drawing 8 . Since the convex part 3c is formed also in the opposite field of the spring washer 3, it presses down by rotation of the spring washer 3 and the spring washe this example carries out a spring operation also here. In addition, this may be reverse, although the cam part 2b of the base portion material 2 is a crevice and the spring washer 3 is the convex part 3b with the form of this operation.

[0021] Drawing 9 is the top view (a) and front view (b) in the state where attached the base portion material 2 and the spring washer 3 which are shown in drawing 7 and drawing 8 , and it completed. Also in the form of this operation, when the base portion material 2 carries out relative rotation to the spring washer 3, a rotational torque occurs with the relation of the

relative angle of the convex part 3b of the spring washer 3, and the cam part (U character slot) 2b of the base portion material 2. This rotational torque performs opening and closing and maintenance of a lid.

[0022] Drawing 10 is the front view (a), side view (b), and central longitudinal section (c) of the spring washer further applied to the form of other operations of this invention. The form of this operation to both sides of the and although illustration was omitted, it forms and uses the hemispherical crevice corresponding to this ball 5 also for the base portion material 2. Others are the same as that of the form of said operation, and carry out the same operation. Since the ball 5 is formed in the control washer 4 side of the spring washer 3 as well as the form of said operation also with the form of this operation, the spring washer 3 will bend between the control washers 4, and a spring operation is carried out also here.

[0023] In addition, this invention is not limited to the form of said operation, and all modification that does not deviate from the range of this invention is permitted. For example, various modification is possible for the form of the form of a cam part, ****, and a crevice, and it can adopt not only the spring washer 3 but a board spring, a plate spring, etc. also as a spring member.

[0024]

[Effect of the Invention] According to this invention, the following effects are done so as explained to details above.

(1) Conventionally, since it is the structure which contacts base portion material with a cam part in a direct spring member (spring washer) as compared with structure, the sliding cam member (one of the two cam members) of structure becomes conventionally unnecessary, and the part and part mark become easy [structure] few.

(2) With easy structure, since there are few part mark, trouble does not start attachment, either, but it becomes easy, accurate attachment becomes possible, and quality improves.

(3) Since structure is easy, manufacture becomes easy, and since there are few part mark, it becomes inexpensive at the whole.

(4) With easy structure, since there are few part mark, a light weight and a miniaturization are attained.

(5) Since the load characteristic and a rotational torque can be adjusted easily, it can respond to the closing mechanism of the opening-and-closing member of the large range.

[Translation done.]